What is Claimed Is:

- A process for preparing a mixture of a 5,7,3',4'-tetra-O-protected epicatechin (4β,8)-dimer and other oligomers comprises the step of coupling a 5,7,3',4'-tetra-O-protected
 epicatechin monomer with a 5,7,3',4'-tetra-O-protected-4-acyloxy epicatechin monomer in the presence of an acidic clay.
 - 2. A process for preparing a mixture of 5,7,3',4'-tetra-O-protected epicatechin (4 β ,8)-oligomers comprises the step of coupling a 5,7,3',4'-tetra-O-protected epicatechin (4 β ,8)-oligomer with a 5,7,3',4'-tetra-O-protected-4-acyloxy epicatechin monomer in the presence of an acidic clay.
 - 3. The process of Claim 1 or 2, wherein the acidic clay is a mortmorillonite clay.
 - 4. The process of Claim 1, wherein the protecting groups on the protected monomers are protecting groups which do not deactivate the A ring of the protected monomers.
- 5. The process of Claim 2, wherein the protecting groups on the protected oligomer are
 protecting groups that do not deactivate the A ring of the upper mer of the oligomer and the protecting groups on the protected monomer are protecting groups that do not deactivate that A ring of the monomer.
 - 6. The process of Claim 4 or 5, wherein the protecting groups are benzyl groups.
- 7. The process of Claim 1 or 2, wherein the 4-acyloxy group is a C₂-C₆ alkoxy group having
 20 a terminal hydroxyl group.
 - 8. The process of Claim 7, wherein the C_2 - C_6 alkoxy group having the terminal hydroxyl group is a 2-hydroxyethoxy group.

- 9. The process of Claim 1, wherein the protected monomers are 5,7,3',4'-tetra-O-benzylepicatechin and 5,7,3',4'-tetra-O-benzyl-4-[2-hydroxyethoxy]epicatechin; wherein the mixture comprises the benzyl-protected epicatechin $(4\beta,8)$ -dimer and benzyl-protected epicatechin $(4\beta,8)$ ₂-trimer.
- 5 10. The process of Claim 9, wherein the benzyl-protected epicatechin (4β,8)-dimer is the major product in the mixture.

10

20

tetrafluoroborate.

- 11. The process of Claim 2, wherein the oligomer is a benzyl-protected $(4\beta,8)$ -dimer; wherein the monomer is 5,7,3',4'-tetra-O-benzyl-4-[2-hydroxyethoxy]epicatechin; and wherein the mixture comprises a benzyl-protected epicatechin $(4\beta,8)$ -dimer, a $(4\beta,8)_2$ -trimer, and a $(4\beta,8)_3$ -tetramer.
- 12. The process of Claim 1, further comprising the step of separating the protected dimer and other protected oligomers from the monomer by column chromatography.
- 13. The process of Claim 2, further comprising the step of separating the protected oligomers and protected monomer by column chromatography.
- 15 14. The process of Claim 12 or 13, further comprising the step of replacing the protecting groups on the separated dimer or oligomers with hydrogen.
 - 15. A process for preparing a mixture of benzyl-protected (4 β , 8)-oligomers of epicatechin or catechin comprises reacting a 5,7,3',4'-tetra-O-benzyl-protected epicatechin or catechin monomer or a 5,7,3',4'-tetra-O-benzyl-protected (4 β ,8)-epicatechin or catechin oligomer and 3-O-acetyl-4-[(2-benzothiazolyl)thio]-5,7,3',4'-tetra-O-benzylepicatechin in the presence of silver

- 16. A process for preparing a mixture of acetyl-protected and benzyl-protected (4 β ,8)oligomers of epicatchin or catechin comprises reacting a 3-*O*-acetyl-5,7,3',4'-tetra-*O*benzylepicatechin monomer or a 3-*O*-acetyl-5,7,3',4'-tetra-*O*-benzylepicatechin (4 β ,8)-oligomer
 and 3-*O*-acetyl-4-[(2-benzothiazolyl)thio]-5,7,3',4'-tetra-*O*-benzylepicatechin in the presence of
 silver tetrafluoroborate.
- 17. The process of Claim 15 or 16, wherein the silver tetrafluoroborate is dried before the reaction.

5

- 18. The process of Claim 17, wherein the drying is vacuum drying carried out immediately before the reaction.
- 10 19. The process of Claim 16, wherein the mixture comprises protected trimers through protected octamers.
 - 20. The process of Claim 15 or 16, further comprising the step of isolating the protected oligomers in the mixture by reverse phase high pressure liquid chromatography.
 - 21. The process of Claim 20, further comprising the step of removing the acetyl-protecting group(s) from the isolated oligomers.
 - 22. The process of Claim 21, wherein the acetyl group(s) removal is carried out with aqueous tetra-n-butyl ammonium hydroxide.
 - 23. The process of Claim 20, further comprising the step of removing the benzyl-protecting groups from the isolated oligomers.
- 20 24. The process of Claim 23, wherein the benzyl groups removal is carried out by hydrogenolysis.

- 25. The process of Claim 20, further comprising the steps of removing the acetyl protecting group(s) and then removing the benzyl protecting groups from the isolated oligomers.
- 26. The process of Claim 25, wherein the acetyl group(s) removal is carried out with aqueous tetra-n-butyl ammonium hydroxide and the benzyl groups removal is carried out by hydrogenolysis.

5

- 27. A process for preparing a mixture of 5,7,3',4'-tetra-O-benzyl (4 β ,8)-oligomers comprises the steps of:
- (a) activating with 2-(benzothiazolyl)thio groups the C-4 positions of each of epicatechin 5,7,3',4'-tetra-O-benzylepicatechin; and
- (b) self condensing the activated, protected monomers in the presence of silver tetrafluoroborate or an acidic clay to form a benzyl-protected condensed epicatechin $(4\beta,8)$ -oligomer.
- 28. The process of Claim 27, further comprising the steps of separating the protected dimer, trimer, and tetramer removing the benzyl protecting groups.
- 15 29. A process for chain extending protected epicatechin (4β,8)-oligomers comprises the step of condensing an epicatechin (4β,8) oligomer having 3-O-acetyl protecting groups and 5,7,3',4'-tetra-O-benzyl protecting groups on all mers and a C-4-[2(benzothiazolyl)thio] activating group on a terminal mer with an epicatechin oligomer having 3-O-acetyl and 5,7,3',4'-tetra-O-benzyl protecting groups on each mer in the presence of silver tetrafluoroborate or an acidic clay.
- 30. The process of Claim 29, wherein one of the C-4 activated, protected oligomers is a 3-*O*-acetyl-5,7,3',4'-tetra-*O*-benzylepicatechin-(4β,8)-[3-*O*-acetyl-4-[(2-benzothiozolyl)thio-5,7,3',4'-tetra-*O*-benzylepicatechin]; wherein the benzyl-protected oligomer is tetrakis (3-*O*-acetyl-

- 5,7,3',4'-tetra-O-benzyl)epicatechin (4 β ,8), wherein the protected, chain-extended oligomer is hexakis (3-O-acetyl-5,7,3',4'-tetra-O-benzyl tetramer epicatechin) (4 β ,8)₅-hexamer.
- 31. 4-[(2-Benothiazolyl)thio]-5,7,3',4'-tetra-*O*-benzylepicatechin or 4-[(2-benzothiazolyl)thio]- 5,7,3',4'-tetra-*O*-benzyleatechin.
- 5 32. A process for preparing the compound of Claim 31 comprises reacting 5,7,3',4'-tetra-*O*-benzyl-4-(2-hydroxyethoxy)epicatechin or 5,7,3',4'-tetra-O-benzyl-4-(2-hydroxyethoxy)catechin with an organoaluminum thiolate generated from 2-mercaptobenzothiazole.
 - 33. 4-[(2-Benzothiazolyl)thio]-3-*O*-acetyl-5,7,3',4'-tetra-*O*-benzylepicatechin or 4-[(2-benzothiazolyl)thio]-3-*O*-acetyl-5,7,3',4'-tetra-*O*-benzylcatechin.
- 34. A process for preparing the compound of Claim 33 comprises reacting 5,7,3',4'-tetra-*O*-benzyl-4-(2-hydroxyethoxy)epicatechin or 5,7,3',4'-tetra-*O*-benzyl-4-(2-hydroxyethoxy)catechin with an organoaluminum thiolate generated from 2-mercaptobenzothiazole followed by acetylation.
- 35. A method of treating breast cancer in a mammal in need of such treatment, which

 15 treatment inhibits cancer cell growth through cell cycle arrest in the Go/G phase and comprises administering to the mammal epicatechin-(4β,8)₄-pentamer, wherein the breast cancer cells are selected from the group consisting of human breast cancer cell lines MCF-7, SKBR-3, MDA 435, and MDA MB-231.
- 36. The method of Claim 35 wherein the pentamer is a purified procyanidin fraction isolated from cocoa beans as a cocoa extract.
 - 37. The method of Claim 36, wherein the pentamer is a synthetically prepared procyanidin.